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INTERVIEW WITH USSR GAS INDUSTRY MINISTER

Kiev PRAVDA UKRAINY in Russian 5 Sep 82 p 2

[Article by V. Dinkov, USSR minister of gas industry: "Foundation of Industry"]

[Text] At the request of the editors of PRAVDA UKRAINY, USSR Minister of Gas Industry V. A. Dinkov discusses the tasks, problems and development prospects of one of the most important branches of the economy as well as principal areas of its cooperation with our republic's scientists.

In the last 15 years natural gas production in the Soviet Union has grown by a factor of 3.5, reaching a figure of 465 billion cubic meters in 1981. The Unified Gas Supply System was formed. The percentage share of natural gas in the USSR's fuel and energy balance is presently 27 percent.

In his report at the 26th CPSU Congress, Comrade L. I. Brezhnev specified a rapid increase in the production of Siberian natural gas as a task of primary economic and political importance. We must bring new gas fields into production, build and bring on-line five major natural gas trunk pipelines from Western Siberia to the central oblasts, as well as the Urengoy-Uzhgorod natural gas export pipeline. The importance of these tasks is increasing to an even greater extent in connection with attempts by the Washington administration to use "sanctions" in order to impede construction of this pipeline, which is intended to supply Soviet natural gas to the countries of Western Europe. The patriotic initiative by the workforces of the enterprises and organizations of a number of ministries, approved in July of this year by the CPSU Central Committee and USSR Council of Ministers, to ensure prompt entry into service of Urengoy-Pomary-Uzhgorod natural gas trunk pipeline, constituted a decisive response to these attempts.

Natural gas production is to be boosted to 630 billion cubic meters by 1985. No country has ever achieved such a rate of growth!

Our ministry has long been productively cooperating with the institutes of the UkSSR Academy of Sciences. Annual savings from adoption of their research results in our branch have reached the figure of several tens of millions of rubles to date.

Let us take natural gas trunk pipeline transmission. Reliability is a most important condition for satisfactory performance. We need well-made pipe, high-quality welding, construction and installation, and protection against corrosion. Considerable productive research results have been accomplished at the Institute of Electric Welding imeni Ye. O. Paton (reinforced quasimonolithic steels, multilayer pipe and crack dissipator "traps") and the UkSSR Academy of Sciences Institute of Problems of Materials Science (cold-resistant steels).

We have recently requested that the UkSSR Academy of Sciences devise effective and economical methods of testing gas pipelines and develop means of quality control of construction and installation operations.

A natural gas pipeline is a complex system. It is continuously affected by external factors -- water from rain and melting snow, temperature fluctuations of the ambient air, soil, and gas in the line. Substantial mechanical stresses occur in pipes. A sensitive instrument is capable not only of detecting the most barely noticeable defect but also of spotting potentially dangerous areas in which there are no defects yet but where a breakdown situation may develop. We need such instruments.

Just as man-made structures, natural gas pipelines age. Repairs and maintenance are needed. Considerable funds and material resources are expended on this. We need to develop an extensive inventory of specialized machinery, mechanisms, and devices. But that is not all. We also need fundamentally new repair and maintenance methods, so that some procedures can be performed, for example, without shutting down a trunk pipeline. Once again the people at the Paton Institute are helping us. They have proposed a method of connecting terminal branches to operating natural gas pipelines with the aid of explosive welding, without shutting down the pipeline. We shall also be able to use methods of restoring corrosion-damaged pipe using adhesive compounds developed at the UkSSR Academy of Sciences Institute of Chemistry of High-Molecular Compounds.

All these examples graphically demonstrate that the reliability of natural gas pipelines is a multifaceted problem, solution of which requires the joint efforts of scientists and other specialists of the most diversified areas of specialization.

One of the main features characterizing the development of our gas industry is determined by the distribution of its raw material base and rapid rate of gas production increase. Since the main producing areas are in Western Siberia, while the principal consumers are in the European part of the USSR, the average distance of natural gas transport is continuously increasing, resulting in increased transport costs. In addition, considerable expenditures are caused by the difficult natural-climatic conditions of Western Siberia.

Practical realities demand a new approach to the scientific and technical problems facing this industry, and solid support by science. It is precisely for this reason that a joint session of the board of the USSR Ministry of Gas Industry and the Presidium of the UkSSR Academy of Sciences was held, at which a decree was adopted which specified the directions of future cooperation.

Drilling volume in our industry is to increase by a factor of more than 1.5 by 1985, with an equal rate of increase in the schedule speed of well drilling. Here as well such a sharp advance can be achieved only by employing new equipment and technology: rock-attacking tools developed at the UkSSR Academy of Sciences Institute of Superhard Materials, and formulas for highly-effective cementing in of wells in the Astrakhan field, proposed by Ukrainian chemists. The first unit of a large natural gas chemical complex by Astrakhan will be coming on-line. Since the gas contains approximately 23 percent hydrogen sulfide and an equal percentage of carbon dioxide, reliable equipment and steels resistant to corrosion and sulfide cracking will be needed.

We are working on automating the designing of gas industry facilities, employing economic-mathematical methods and computers. The UkSSR Academy of Sciences Gas Institute, working in collaboration with our branch design organizations, has devised efficient software for achieving optimal designing and operation of natural gas pipelines. It will be possible to select optimal gas transport configurations. The software has already been utilized with considerable effectiveness in designing the Urengoy-Chelyabinsk, Urengor-Petrovsk, Urengoy-Novopskov, Urengoy-Uzhgorod and other natural gas trunk pipelines. The domain of activities of our branch is not limited to land: we are tapping gas and oilfields on the continental shelf. Our principal tasks include developing platforms both for deep-water non-freezing seas and in an ice-resistant model.

The UkSSR Academy of Sciences is also participating in solving these problems. Very important for our branch is the research being done by scientists at the Electric Welding Institute, who helped our specialists master the technique of welding thick-walled tubular components of the base units of stationary platforms, and also designed an automatic welder for vertical-extending piles.

Since the volume of fabrication of welded structures for the continental shelf will increase substantially in coming years, we must proceed now to solve the problem of automating welding operations at the work stations on pipe lay barges. It is also necessary to speed up the development and adoption of methods of underwater welding and cutting metals in various structures at depths of 100-300 meters and methods of inspecting underwater welding operations.

In the Caspian basin there is a fairly large number of fixed platforms which are no longer in use. They are a menace to navigation and, most important, thousands of tons of metal lie immobilized in them. Here we are hoping to employ the technique of underwater directional-explosion pile cutting.

Modern geophysical methods are being extensively adopted in offshore exploration. Serious scientific-technical application is essential here, as well as the development of new Soviet geophysical complexes utilizing the latest advances in physics and electronics.

It would be expedient to unite the efforts of the organizations of the USSR Ministry of Gas Industry and the institutes of the UkSSR Academy of Sciences in studies aimed at preventing pollution of the Black Sea and Sea of Azov in

the process of their commercial exploitation, as well as in developing equipment and chemicals to clean up possible oil spills.

The range of joint activities is extremely broad, and we hope that our productive collaboration with the scientists at the UkSSR Academy Sciences will grow stronger with each passing day.

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CALL FOR AUTOMATED DRILLING EQUIPMENT

Moscow IZVESTIYA in Russian 18 Sep 82 p 1

[Article by I. Karpenko, special correspondent of IZVESTIYA: "The Experimental Model Is Ten Years Old: Why Has the Implementation of Automated Drilling Been Delayed?"]

[Text] Specialists have calculated that in order to stay at the present level in extracting oil and gas, the amount of drilling will have to be doubled every five years.

The problem is extraordinarily complex. If the now existing technology is used as a guide, it means that already at the first stage, in order to double the volume of drilling, more than two and onehalf thousand additional machine tools will have to be produced, plus an additional onequarter of a million tons of drilling pipe. And in the drilling itself, the number of workers would have to be increased by over 250,000 persons. Of these, 70,000 would have to be drilling brigade workers and specialists of professions where there is the greatest manpower shortage today. Their training deserves a special word: This is one of the most critical aspects of the problem. A driller becomes highly skilled after five or six years of work, and even then, not all of them. And this means that doubling the number of rigs and drilling brigades in itself will not immediately increase the volume of drilling by the same amount.

All this taken together inescapably leads to one conclusion: Only technical progress and full automation of production will allow the problem to be resolved without having to divert very large labor and material resources from the national economy. This is the main salvation for this branch of industry. Is there a possibility for such a radical retooling? Yes, all the necessary conditions exist for this to take place.

Fifteen years ago, the laboratory of the All-Union Scientific Institute for Methodology and Exploration Technology (VITR) of the USSR Ministry of Geology constructed a light apparatus, "Leningradets BA-25," in which the basic processes for drilling wells were automated. It is interesting that record-breaking technical-economic indicators were achieved even with the experimental model. The principles of this design were used as the basis for the "Uralmash 125A" apparatus for deep drilling. The chief organization for constructing it became "Uralmash," and the co-contractors were the VITR

laboratory and the All-Union Scientific Research Institute for Electrical Drives. In 1974 the partners built an experimental model and began testing it in Belorussia.

At first everything went smoothly with the new machine. The design of automated apparatuses had been provided for by a special line in the "Basic Directions for the Development of the USSR National Economy for 1976-1980," and the periods for serial production were designated in the Five-Year Plan. However, complications arose unexpectedly. Testing of the apparatus kept being prolonged. The partners managed to transfer the assembly, and even the manufacture of many components to a small collective of the VITR laboratory that did not have the production capability. Each new stage of work began with a surge of activity, and dragged on through endless negotiations with subcontractors.

IZVESTIYA, taking charge for the completion of an important order of the Five-Year Plan, several times criticized the red tape. Using the material provided by the newspaper, commissions were formed and meetings were called (even at the ministers' level), the matter would, for a time, move from its dead stop and then gradually die out again.

It is difficult to say if the automated apparatus would have reached the working stage at all, had it not been for the substantive assistance of the Leningrad Regional Committee of the party, the USSR Ministry of Geology and Minister Ye. Kozlovskiy, all having done a great deal to strengthen the VITR laboratory. It was transformed into a special design bureau for the automation of drilling, staffed with skilled cadres, and received industrial sites, equipment, manpower, etc. Finally, the testing of the automated apparatus ended successfully, and the machine drilled a well, as planned, that was 3,300 meters deep, near the town of Rechitsa.

While all these events unfolded at an unhurried pace, the SKB [Special Design Bureau] collective for the automation of drilling did a great deal to improve the apparatus and to provide it with the kind of equipment that would satisfy all the requirements for a modern automated machine. Today, for all practical purposes, this machine is a robot that allows drilling to be carried on entirely in the automated mode. And the main thing is that not only are all traditionally heavy manual jobs in drilling eliminated, but the very nature of a drillers job changes, for he becomes the operator of a machine. In a word, through the efforts of the SKB for the automation of drilling, "Uralmash" and the All-Union Scientific Research Institute for Electrical Drives, an apparatus was designed that in the degree of its automation, is far ahead of all analogous foreign machines, and can be used as a basis for the radical retooling of this branch of industry.

Nevertheless, today we are about as far away from this kind of retooling and even serial production of the automated machine as we were ten years ago when work was conducted on the only experimental model in existence at that time. The tasks stipulated by the last FiveYear Plan were aborted. At first the date for bringing out the next lot of automatic machines, in accordance with the corrected documentation, was postponed by "Uralmash" beyond the expiration date of the last FiveYear Plan, and then was carried over from last year to the current year.

One can, of course, understand the position of the plant directors, for whom a shift to new production is usually connected with a certain risk, additional work, a loss in the volume of production and a decrease in the technicaleconomic indicators. And in addition, the present drilling rigs are also in high demand; the increase in the volume of drilling, as was already mentioned, requires more and more of these rigs. One would think that a more decisive intervention by the Mintyazhmash [Ministry of Heavy and Transport Machine Building] is necessary here and long overdue.

Our plants for drilling equipment are really overloaded now by the serial production of apparatuses necessary for fulfilling the quota set by the 11th FiveYear Plan and it is probably very difficult for them to prepare now for retooling a branch of industry for the next FiveYear Plan. But not preparing for this retooling today, those same plants are dooming themselves to an even greater effort tomorrow and dooming the industrial branch itself to great difficulties in developing our countrys fuel and energy base. After all, we now have a real paradoxical situation: The automated machines are not being produced primarily because the plants involved are overloaded by producing the old equipment; at the same time, the overload can be eliminated only by shifting to new production, and only half as much production would be needed for the same amount of drilling.

A way to get out of this situation has been proposed by the same Leningrad design bureau: To convert the present serial production of drilling rigs into automated ones by fitting them with auxiliary mechanisms, i.e. standard modules. The Directors of the USSR Ministry of Geology showed good initiative by deciding to produce such modules in their enterprises and have already begun to organize production. However, even the needs of geologists, in this case, can be satisfied only through great effort. Needed is a specialized plant whose capacity would be great enough to produce tens and hundreds of these modules. The Leningrad design bureau, if it obtained such an experimental plant, would be ready to take upon itself the assembly of the equipment on the rigs and circulation systems, the technical servicing of automated drilling rigs in the course of their operation, and their further improvement.

These proposals were approved at a meeting called by the USSR Gosplan, in which participants included the leading experts from the ministries that had placed orders for drilling machinery, as well as production ministries. Incidentally, at this meeting the projects of the Leningrad design bureau on automating drilling were evaluated highly as the type of work that constitutes scientifictechnical progress in this branch of industry and that makes it of worldwide importance. However, time is passing and thus far no concrete practical steps have been taken, and there is no specialized plant. True, the directors of the Gosplan conducted negotiations on transferring to the design bureau those plant buildings that belong to the Ministry of Gas Industry and were going to provide them with the necessary equipment. The negotiations, however, came to a dead end and the ministry is refusing to transfer the buildings at this time, even though it is interested more than anyone else in future production work of the plant.

And in summary, while time is passing by, there is still a delay in beginning specialized production, as well as serial production of the automated machine itself. It should be noted here that even the broadest implementation of modules will not eliminate the problem of increasing production of the "Uralmash" apparatus. The fact of the matter is that equipping ordinary drilling rigs with a number of automated nodes will, of course, lighten the labor of the drillers, and increase his productivity, but will not fully solve the problem as would an automatrobot.

And there is another point that should be emphasized: The time frame for retooling this branch of industry, in the best case, is 1015 years of strenuous work by design bureaus and plants of drilling organizations. But if no such work takes place today, the national economy will not receive the necessary benefits from implementing the achievements of science and technology even ten years from now.

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OIL AND GAS

BUZACHI OIL EXPLORATION REPORTED

Baku VYSHKA in Russian 24 Aug 82 p 3

[Article by M. Vorotynova, APN: "The Difficult Oil of the Caspian Area"]

[Text] "... TO ACCELERATE THE ASSIMILATION OF OIL DEPOSITS ON THE BUZACHI PENINSULA!"

(Basic Directions for the Economic and Social Development of the USSR for 1981-1985 and for the Period Up to the Year 1990.)

Until recently few people knew of the existence of this peninsula, located on the eastern shore of the Caspian Sea. As far as that goes, there was nothing there that could attract anyone. Buzachi consists of hundreds of kilometers of sun-parched land that from time to time is inundated by the salt waters of the Caspian. This is a swampy "pudding" of impassable litter, crumbly limestone, mixed with clay and sea "brine." Here, the temperature is 40 degrees centigrade in the summer, with no rain, and in the winter, a hurricane-force wind blows at a temperature of 30 degrees centigrade below zero. There is no fresh water.

And on this godforsaken corner of the earth geologists discovered oil. Recently the "Komsomol'skneft'" oil and gas extracting directorate was formed here. In the very first year that the peninsula was assimilated into the economy (1980), two local fields, Kalamkas and Karazhanbas, provided more than 1.2 million tons of "liquid gold." This year the output will be more than twice that amount.

It is not easy to obtain oil from the Buzachi Peninsula either. Before oil extraction could start, the sea had to be "moved." In the course of several months, hundreds of aircraft dumped 1.5 million cubic meters of stone and sand into the salt water, creating a 32-kilometer long dam. Powerful pumps took the water out beyond the dam. And only after this was it possible to drill wells. There are already hundreds of them here. Nearly every well is located on a landfill, around which are saltwater swamps. Heavy equipment is moved on steel rails, laid through the quagmire. The laid path is periodically disassembled and laid anew, in order to move the equipment ahead. The drilling rig has wagonettes attached to it for living quarters and a dining

car; they are all air-conditioned. The oil workers jokingly call this installation an "armored train." It helps them conduct their offensive to obtain oil and allows them to win time for repair and to work no worse than they would on dry land.

An electric power line has been extended to the peninsula; an automobile road has been built; a 200-kilometer long oil pipeline has been laid to the port of Aktau; a watermain 70 kilometers long; a station for purifying and filtering industrial water is being installed; various reservoirs and internal sub-stations are being built; and bases and living quarters are being constructed. Over one quarter billion rubles have already been spent in assimilating the peninsula.

Not only are the approaches to Buzachi oil difficult, but also the extraction process itself. The raw material is highly viscous, heavy, and resinous. Under the usual method of extraction, a stratum gives up no more than 15%, although no less than 40-60% needs to be extracted. All traditional methods applied for displacing oil by pumping water into the stratum are useless here. New force methods are used in Buzachi on deposits of highly viscous oil. Steam is pumped into the strata or artificial combustion centers are created (the stratum is ignited). Due to the force of high temperatures, the oil becomes more liquid and moves upward because of the pressure. This thermal method allows the same amount to be extracted from strata bearing heavy oil as low viscosity oil by the usual method.

A new administrative district, the Munaylinskiy district, has been especially established ("munayla" means "oil" in the Kazakh language). This permits an efficient resolution of an entire range of problems connected with the development of deposits on the Buzachi Peninsula, especially with regard to the creation of liveable conditions for the oil workers.

Thus far, the district has a permanent population of 13,000 persons, even though the number of workers is over 16,000. The shift method of servicing industries is practiced here, which has already been used in many remote areas of the country. The people work for half a month in industrial enterprises and rest half a month at home: in Makhachkala, Groznyy, Baku, Alma-Ata, Shevchenko and other cities. The enterprise pays the cost of the round trip.

A great amount of manpower and resources are being spent in Buzachi for providing normal living conditions. Comfortable shift settlements are quickly being built here. At the site of the Kalamkas deposits, for example, an entire small town has sprung up in a short time. The modern, preassembled little houses are clean and cozy, every room is supplied with an air conditioner and refrigerator. In the winter there is steam heat. The settlement has a large trading society, including ten dining rooms (seven of which are right on the oil rigs), two stores, cafeterias, barbershops, a library, a club with a capacity for 350 persons and a steambath. The industrial enterprises are being made as comfortable as those back home and are becoming well-organized.

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KARAKUMY GAS EXPLORATION

Ashkhabad TURKMENSKAYA ISKRA in Russian 14 Sep 82 p 2

[Article by V. Ivanova: "Rich Are the Depths of the Karakumy"]

[Excerpts] The fast growing needs of the country's national economy for cheap fuel and chemical raw materials have resulted in an accelerated assimilation into the economy of oil and gas deposits. This activity has involved the best efforts of geologists, drillers, builders and operational personnel. It is gratifying that Turkmenistan is also contributing its share toward strengthening the fuel energy base of our country. By the end of the 11th Five-Year Plan, the Republic has projected the attainment of an output of up to 81-83 billion cubic meters of gas and the expansion of work in exploratory and production drilling for oil and gas.

Workers of leading branches [of this industry] are persistently striving to attain the projected goals. The successes of the "Turkmengazprom" All-Union Industrial Society collective make one happy. Since the beginning of the year, over 700 million cubic meters of the light blue fire have been extracted, all of it exceeding the plan.

Energetically and purposefully the people went out to conquer the new gas deposits. Having opened up the first large storehouse in Achak, in record time they supplied gas to the country, combining the exploratory and development stages. Then a new, progressive method was used, whereby one well exploited two different levels, which resulted in a great economic benefit.

Having started, the workers of the new area penetrated the depths of many places in the Karakumy that earlier had not been accessible. They get the credit for that pearl of gas [fields], Shatlyk. It took labor, energy and courage before the first gas fountain hit here. But today Shatlyk is the basic supplier of cheap natural fuel.

One other valuable gas field has been opened in the Karakumy desert, the Dauletabadskiy deposit. Dozens of wells have been drilled here by geologists and production workers. And every one of them produced a large flow of the light blue fuel. Concurrently, there is a building expansion of the storehouse. The collective of the "Shatlykgazstroy" trust is completing the construction of the first installation for the complex preparation of gas. In a short time, the gas of Dauletabad will also flow along the steel pipeline to the center of the country.

A large task lies before the gas extractors: They must penetrate the deeper levels. The first wells indicated good prospects for deep-lying strata.

And in the western part of the Republic, there is a search going on for ways to increase oil output. New, gushing wells, both on land and in the sea, are going into production. Deposits at Kamyshldzha, which recently began to be exploited, have provided a large flow of oil. Exploration of the Caspian expanse is proceeding intensively. And advanced methods for intensifying oil output are being used in areas of old deposits.

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PLATFORM CONSTRUCTION FOR CASPIAN

Ashkhabad TURKMENSKAYA ISKRA in Russian 14 Sep 82 p 2

[Article by Rasim Shukyurov, APN correspondent: "Steel Islands"]

[Text] Without an explanation from experts, it would be difficult to determine the purpose of this metal "shelf," impressive with its size. In its outward appearance, it resembles supports on which television antennas or electric power lines are usually attached. In fact, however this pyramidal block, made at the Machine Building Plant imeni October Revolution in Baku, is a componenet of a platform for drilling wells in the deep water expanse of the Caspian Sea.

The artificial island platforms have their beginnings in an assembly area, established beyond the city limits, on the seashore. And this is where we became acquainted with the leader of the assembly team, Minakhmed Yarulov.

"This is the first time we are constructing something this size," he said. "The block, 2,100 tons in weight and as high as a 40-story building, will be placed in a part of the sea that is 100-110 meters deep. The platform is actually two-stories high: The lower story will contain the drilling equipment, and the upper a hotel-type living area for 70 persons, a medical station, dining room, recreation room and a helicopter pad..."

Mass production of platforms for sea areas began at the end of the 1940's. By this time the Azerbaijani project engineers had discovered the optimal variant for constructing platforms and connecting them with above-water trestle streets.

The experience of the Azerbaijani oil workers has attracted the attention of foreign experts. Guests from dozens of countries familiarized themselves with the technology of marine industry building used for the construction. Hydro-technical structures were erected on the shores of Bulgaria, India and Cuba, with the aid of Azerbaijani specialists.

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OIL AND GAS

SAL'YANYNEFT' INCREASES OIL FLOW

Baku VYSHKA in Russian 16 Sep 82 p 2

[Article by K. Vezirov, chief of the production-technical department of the Sal'yanyneft' Oil and Gas Production Administration: "Calculating on Reserves"]

[Excerpts] The workforce of the Sal'yanyneft' NGDU [Oil and Gas Production Administration] must solve a great many complex problems in its well operations and, as experience has shown, experience and the ability to work efficiently and utilize oil production reserve potential intelligently and applying good engineering practices predetermine in large measure the success of operations.

For a long time a high-pressure gas pool was used in Kyursangya, in Field Number 1, to keep the gas-lift wells operating normally. In recent years, however, exhaustion of natural energy has affected the flow of hydrocarbons from the pay sand. It was necessary to change the wells over from gas-lift to bottom-hole pump production, which involved many difficulties.

The fact is that the majority of wells in this section run to 2000 meters or more, and it was essential precisely to figure the arrangement of subsurface equipment on the basis of the wellbore suspension system and to install an electric motor and beam bumping unit of suitable capacity. Many of the administration's services took part in this work, and we must state that the workers, engineers and technicians displayed a great deal of creative initiative and sharpness in order to speed up accomplishment of the specified measures.

At the suggestion of engineer Gamidulla Kurbanov, for example, in place of concrete foundations for the beam pumping units, they began fabricating metal foundation supports out of discarded pipe, which reduced costs and accelerated installation of equipment. This work is presently continuing on those wells which will no longer produce by natural energy.

Considerable attention in the oilfield is being devoted to studying wells by various geophysical methods, which makes it possible more precisely to determine the potential of the producing formation, and subsequently to increase well yield by all possible means.

Here is an example. Well No 150 was producing a flow of 5 tons of crude. This did not satisfy the geologists. They instructed the geophysicists to measure

the inflow profile. It was determined with the aid of precision instruments that one of the three liners was not passing fluids. It was obvious what had to be done. Producing zone 3 was perforated from top to bottom. The results exceeded all expectations. The well flow increased from 5 to 45 tons of crude per day.

The same technique was used to establish a good production flow in Well 210, although it had been pumping only 8 tons a day. After perforating the liner, the daily well flow of crude increased by 37 tons.

We shall note that an increase in the volume of geophysical well logging procedures made it possible to increase both the quantity and quality of oilfield operations. In the first 8 months of this year, for example, 421 geologic-technical measures were performed, 80 more than scheduled, which boosted production by 32,000 tons of crude.

Considerable attention in the Kyursangya oilfield, which is distinguished by complex geologic structure, is also devoted to adoption of the method of maintaining formation pressure by water flooding. Acidizing is performed to increase the absorptivity of injection wells, and surfactants are extensively employed. All this has a positive influence both on water flooding conditions and on production from the producing formations.

Paraffin is a serious problem. Many various means were tested in the Sal'yanyneft' oilfields, but many proved ineffective. Mechanical paraffin removal, for example, is very laborious. Nor does the employment of lined pump-compressor piping produce substantial results, since the integrity of well capping is disturbed in the process of well operation and maintenance. Thermal methods of paraffin removal could be successfully employed, but unfortunately this method is in extremely limited use due to a shortage of mobile steam units.

The most economical means of combating paraffin deposition proved to be the chemical method, that is, employment of a solvent to clean wells of paraffin. This procedure has been substantiated in enterprise standards, which are being extensively adopted. It is true that due to a shortage of solvent we frequently must employ condensate, but the cost is repaid by a substantial increase in production.

At one time in this section, as well as in other sections of the oilfield, rods began breaking with increasing frequency. What was the problem? An optimal suspension arrangement was determined in these wells with the aid of ionograms proposed by specialists at AzNIPIneft', and high-strength rods were used. As a result, well operation time between maintenance increased from 50 to 65 days.

The workforce of the Sal'yanyneft' NGDU is working with great labor enthusiasm, preparing to honor in a worthy manner the 60th anniversary of establishment of the USSR. In the first 8 months of the year 2083 tons of crude and approximately 40 million cubic meters of natural gas were produced above target. This is considerably more than specified by pledges.

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LENTRANSGAZ OPERATION REPORT

Leningrad LENINGRADSKAYA PRAVDA in Russian 5 Sep 82 p 1

[Article by A. Travin: "Pulsebeat of Natural Gas Trunk Pipelines"]

> [Excerpts] Oil and gas occupy a leading position on the country's fuel balance sheet. At the same time they are also a most valuable chemical feedstock, essential to various industries. Crude oil and natural gas requirements are steadily growing, and the workers of the industry on which depends a great deal in accomplishing the party-assigned task of achieving accelerated development of the fuel and energy complex are redoubling their efforts in order to accomplish plan-specified targets and socialist pledges with honor.
>
> Leading enterprises include the Lentransgaz Association, the country's largest. Since the beginning of the year its workforce has yielded to nobody in competition and is working at an increasing pace. Our story is about the achievements of this workforce and those who are standing difficult duty watch on natural gas trunk pipelines.

Normal operation of industrial enterprises and agricultural complexes is impossible without gas, just as it is impossible without electricity. Millions of Soviet citizens use gas in their homes, paying the world's lowest rates. A great responsibility rests on the shoulders of those who produce, transport, and distribute natural gas to the customers. The pulsebeat of the natural gas trunk pipelines should not slow for a single minute. This has also become an unswerving rule for the specialists among the many thousands of employees of the Lentransgaz Association.

It operates more than 6000 kilometers of natural gas trunk pipelines and terminal branches, 14 powerful compressor and 140 gas distribution stations, as well as 3 underground natural gas storage facilities. The association supplies gas to the Northwest, the Baltic, the central oblasts, and also supplies natural gas to Finland and Western Europe. Managing such an operation is no easy feat. Nevertheless the workforce is finding ways to increase volumes of gas transported. This year alone 7 billion cubic meters more were conveyed to customers than last year.

"We achieved this thanks to technical advances and further development and improvement of our gas pipeline systems," states association chief engineer V. A. Gorbel'. "New sections on the Gryazovets-Torzhok route were brought on-line, as was the third unit of the Torzhok-Minsk-Ivatsevichi line; compressor stations were completed in Volokolamsk, Kalinin and other oblasts, and a good deal of sophisticated equipment was installed at facilities which have long been in operation."

In response to discriminatory steps taken by the U.S. Administration, which seeks to thwart construction of the Siberia-Western Europe natural gas pipeline, the association's workforce resolved to complete ahead of schedule renovation of a special test bed in Novgorod for testing powerful GTN-25 units. The first unit, designed for a pressure of 75 atmospheres, was successfully tested. Soon tests will be performed on the second unit -- designed for a pressure of 100 atmospheres.

But boosting production potential is only one aspect of the question. Another, no less important aspect is to utilize that potential intelligently. Socialist competition in honor of the 60th anniversary of establishment of the USSR is directed toward improving work efficiency. People's job proficiency is improving in the course of this competition; they are achieving the highest results in their labor.

The rivers of natural gas must travel many thousands of kilometers from the northern part of Tyumen Oblast to reach the consumers. And although pipelines are the cheapest mode of transporting natural gas, considerable electric power, fuel, and lubricants are required to observe proper pipeline operating conditions. In the association these items are consumed in smaller quantities than specified by standards. Just since the beginning of the year, through optimizing equipment operation and tightening economy regimen, savings have amounted to 24 million kilowatt hours of electricity, 4 million tons of fuel, and 27 tons of turbine oil. The cost of transporting natural gas has been reduced by 3.3 percent.

This is a busy time for the association. Energetic preparations are in progress for winter, when gas consumption will increase sharply everywhere. Equipment is rechecked, as is the precision of system operation and the reliability of the entire transport process. The underground natural gas storage facilities are particularly busy. They are completing the establishment of reserves. Many tens of millions of cubic meters of gas can be accumulated in the summer and fall, which can be utilized in winter, depending on need.

An underground gas storage reservoir is a complex aggregate of facilities: a compressor house, dry-bed dehydrators, air cooling units, dust trap units, plus much other equipment. All this efficient equipment is under automatic control. Is there a need for human intervention here?

"Of course," smiled N. I. Ivanov, the association's best operator. "Although, as you see, there are not many of us here (in fact, technology has freed human operators from many operations), but a competent specialist controls the processes. He must possess a consummate knowledge of the equipment and be able to make instant decisions.

Lentransgaz specialists are working in a happy frame of mind. On the eve of their industry's holiday they achieved an important socialist pledge -- they conveyed to the customers 200 million cubic meters of gas above target. The pulsebeat on the natural gas trunk lines is smooth and even, as it should be, and things are very busy.

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REPORT ON SHEL'F-2 ARRIVAL IN BAKU

Baku VYSHKA in Russian 14 Sep 82 pp 1, 2

[Article by O. Nechipurenko: "Before Putting Out to Sea"]

[Text] On the eve of the 62nd anniversary of Soviet Azerbaijan, VYSHKA reported the arrival in Baku of Shel'f-2, a semisubmersible floating drilling rig. We shall remind our readers that it is the first such rig designed for drilling deep wells on the Caspian and it is entirely furnished with Soviet drilling and seafloor wellhead equipment. Adjustment and testing of all on-board systems is currently in the concluding phases, after which Shel'f-2 will take to the open sea -- initially to the Bakhar offshore field area, where the 8 powerful anchors which hold the rig in position during drilling will be operationally tested.

By the 65th anniversary of the Great October Revolution, in conformity with socialist pledges, the rig will take position at a point, at a record 150 meter sea depth, where a well will be drilled to a projected depth of 6500 meters. The new equipment will have its shakedown, so to speak, here in the promising area imeni Mikhail Kaverochkin.

It would be no exaggeration to state that the entire country took part in building this semisubmersible rig. The workforces of 15 principal enterprises, including Astrakhan shipbuilders, Volgograd and Uralsk machine builders, who respectively made the drilling, marine and power equipment for it and dozens of scientific research and design organizations took part in its development. And the rig has indeed turned out fine. The first thing that strikes one is the fact that it is substantially larger than its foreign counterpart....

"Half again as large," states power engineer Rafik Iskenderov, rig party organization secretary. "And the larger size is chiefly to improve working and rest-recreation conditions for the crew.

The rig workforce is headed by experienced oil prospector Asim Gasanovich Efendiyev, who in the last quarter of a century, working in the oilfields of the Baku and Apsheron archipelagoes, has worked his way up from roustabout to drilling administration engineering and technical service chief. Nadir Mekhtiyevich Kyazimov, who is second in charge on the rig, formerly in charge of the jack-up rig "60th anniversary of October," drilling foreman Malik Takhmazov from the rig "Baky," and many others who are presently readying

"Shel'f-2" for service are veterans of the tough school of the Caspian oilfields. They are credited with discovery of more than one oil and gas field, and they perfectly fit a statement, which is now a catchword, by CPSU Central Committee General Secretary Comrade Leonid Il'ich Brezhnev, chairman of the Presidium of the USSR Supreme Soviet: "The labor of oil workers here at sea is more than heroism."

Although much still lies ahead of them, much has already been accomplished. The nucleus of this workforce was formed a year ago in Astrakhan, when the Baku people went up there to help finish construction on their rig. Not only the equipment but the workforce itself and its ability to surmount difficulties were tested there for strength and reliability.

When a storm knocked out power in a large worker rayon in that city, in which the shipyard was also located, the crew of the "Shel'f-2," without waiting to be asked, came to the assistance of the people of Astrakhan. Three power generators on the rig, with a total generating capacity of almost 20,000 kilowatts, for several days provided that rayon with electricity. And in the meantime, in the bitter cold of winter, ignoring the icy wind, the members of the workforce did operational tests on the diesel generator and compressors, meticulously studying their specifications and performance characteristics.

There was plenty of work for everybody, and they took only brief respites from the roaring din of the motors. The fortitude and ingenuity of the Baku oilmen was portrayed in the documentary film "Our Common Cause," which was made by Astrakhan television and dealt with construction of the "Shel'f-2." And the best indicator of the effectiveness of their work is those 1600 changes and modifications in the original plans which were made at the suggestion of the operating crew of the "Shel'f-2" and will be incorporated when building other semisubmersible rigs.

Mechanic Yagub Namazov related enthusiastically in passing what they had already succeeded in accomplishing during that comparatively short period of time the rig has been in Baku. I could hardly keep up with him on the steep companionways leading from the pump room to the engine room and cementing rooms. An improved well cementing setup, efficient distribution of pumps, change in the method of pneumatic transfer of weighting material, plus many other improvements have been made by Yagub Namazov and his comrades. Endeavoring to do everything possible to ensure that the process of making hole will run smoothly and without interruption from the very outset, they are endeavoring to attend to every last detail.

They are studying the experience amassed on the similar "Kaspmorneft'" and "Shel'f-1" rigs, which are presently drilling exploration wells at the Field imeni 28 April, and are adopting new technical solutions. We should note that they are efficient and correct because they always consider these measures jointly, regardless of who bears responsibility for the operation being conducted. This was also the case, for example, in determination of matters pertaining to placement of equipment on the pipe rack deck, where the drilling crew works, or organization of escape and survival, which is under the direction of experienced rig superintendent Petr Alekseyev. In spite of the busy schedule

of preparations for putting to sea, the rig crew members study every day, frequently when they come off shift. They are studying theory and becoming acquainted with the rig's complex instrumentation and the principles of instrument operation. There is a great deal to learn here. Senior mechanic-instrument operator Valentin Vinogradov, who received good experience in the Baku Installation and Setup Administration of the Soyuznefteavtomatika Trust, gave me a briefing on the drilling conditions monitoring system (SKU-"More"), which had been developed at the Moscow All-Union Scientific Research, Planning and Design Institute of Total Automation in the Oil and Gas Industry and was being installed for the first time on the "Shel'f-2."

"Operating and maintaining this system will be a lot of work for us," stated V. Vinogradov, "but when used correctly, it can be highly beneficial to the drilling crews."

Azerbaijan scientists and design engineers are incorporating many new innovations for the first time on "Shel'f-2." The Azerbaijan Scientific Research Institute of Petroleum Machine Building, for example, has devised an efficient mooring system, the Sumgaiti Neftekhimavtomat Scientific Research and Design Institute has developed the Yakor' automatic stationkeeping system, while AzNITEI [expansion unknown] has developed a wellhead equipment control console.

The year of the 60th anniversary of establishment of the USSR should be the year of the baptism of fire for these and many other new Soviet technological innovations in the area of deep-water drilling. To bring this important event closer, the workforce of the "Shel'f-2" is today working hard hand in hand with the riggers, installation people and design engineers, with all those who have participated in building this remarkable rig.

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Kiev NEFTYANAYA I GAZOVAYA PROMYSHLENNOST' in Russian No 3, Jul-Sep 82 pp 55-57

[Article synopses and table of contents]

[Text] UDC 553.98.061.4.(477.52-16)

Gal'chenko, V. A., Krivosheyeva, M. G., Nestor, R. M., et al., "Collectors of the Lower Visean-Tournaisian Petroleum-Gas Bearing Complex of the Northwestern Part of the Dnepr-Donets Basin," pp 2-4

This article reviews questions of change in the capacity and filtration characteristics of porous sandstone collectors of the new Lower Visean-Tournaisian petroleum-gas bearing complex at great depth within the Srebnyanskaya and Zhdanov internal depressions and the zones surrounding them in the northwestern part of the Dnepr-Donets basin. The authors have constructed maps of the collector reservoirs of the principal productive horizons and identified zones with higher values for collector properties. The article has one illustration.

UDC 550.822(477.6)

Yesipko, O. A., Aleksandrov, B. L., and Mulyar, P. N., "Spatial Model of the AVPD [translation unknown] of the Solokhovskoye Deposit of the Dnepr-Donets Basin," pp 11-13.

This article gives the results of an evaluation of interstitial pressures based on the findings of industrial and geophysical studies in wells of the Solokhovskoye deposit. The spatial distribution of pressures by area and cross-section of the deposit is studied by comparing the gradients of interstitial pressures according to correlation profiles and constructing diagrams of change in the isobars of pressure gradients according to sections taken every 100-200 meters and the structural map of the roof of the primary AVPD zone. The article has two illustrations.

UDC 622.24.051

Finogenov, I. S., "Reserves for Reducing the Use of Series-Produced Triple-Cone Bits in Drilling Deep Wells by the Rotary Method," pp 15-17.

Based on analysis of the results of using different types of triple-cone bits in similar conditions to drill deep wells at deposits of the Ukrneft' [Ukrainian Petroleum] Association, the author shows that there are reserves for increasing the cutting per bit and reducing the use of bits by employing the bit recommended by the technological rules and plan in each interval and operating the bit with a heightened axial load and a rate of escape of at least 100 meters per second of drilling solution from the nozzles. The article has two tables.

UDC 622.24.053.8

Andriychuk, I. S., Pelekh, V. G., Bandurin, G. P., et al., "The Work Capacity of Drilling Pipe under Conditions in the Subcarpathian Region," pp 17-19.

This article presents the results of using sets of prefabricated-design steel drilling pipe, weighted drilling pipe, and adaptors. There is an analysis of their actual work capability in the process of well drilling. The article has one table.

UDC 622.245÷537.528

Lyapas, D. N., Kruglitskiy, N. N., Tretinnik, V. Yu., et al., "The Effect of Electrical Firing and Ultrasonic Action on the Properties of Dispersion Systems," pp 23-27.

The article compares the results of structural-mechanical analysis of the water dispersions of palygorskite and montmorillonite obtained by the electrical firing and ultrasonic techniques. The authors describe the mechanism of action of electrical firing on highly dispersed, relatively unconcentrated systems. Analysis of the data obtained holds practical importance for predicting the behavior of dispersion systems in different pulse fields. The article has three illustrations, two tables, and four bibliographic entries.

UDC 546.212.66.067

Striletskiy, I. V., "Tertiary Treatment of Drilling Waste Water," pp 27-29.

The author investigated the tertiary treatment of drilling waste water done by means of active charcoals of grades AG-3 and BAU. The superiority of BAU charcoal to AG-3 for adsorbtion of high-molecular substances from waste water is established. The author also establishes the necessary contact time between the water and the adsorbent. The article has two illustrations and one table.

UDC 622.276.53.054.22

Fedchina, B. M., and Flyunt, I. N., "Experience with the Use of Stems and Gas Separators During Well Operation by Sucker-Rod Pumps," pp 29-30.

The areas of rational application of stems and gas separators hermetically connected with the receivers of sucker-rod pumps were established for conditions of the wells in the Dolinskiy petroleum extraction region of the Subcarpathians. It was established that it is inefficient to use stems in wells that operate

periodically, in wells with an insignificant (3-5 percent) water content in the fluid extracted, and where there is open space between pipes. The article has one illustration.

UDC 665.658.26:665.637.565

Martynenko, A. G., Grechko, V. I., Kalenik, G. S., et al., "Hydrofining Refined Petroleum under Industrial Conditions," pp 38-40.

Under industrial conditions a scheme was implemented for hydraulic treatment of residual refined petroleum obtained by processing tar with paired solvents. M-10V_2 motor oil was produced using the residual component. Motor testing produced positive results. The article has one table and three bibliographic entries.

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TECHNICAL PROGRESS IN UKRAINIAN SSR COAL INDUSTRY ANALYZED

Kiev EKONOMIKA SOVETSKOY UKRAINY in Russian No 5, May 82 pp 69-72

[Article by Candidate of Economic Sciences G. Iovenko and Candidate of Technical Sciences A. Zhurba]

[Text] Production intensification is the main direction for raising the effectiveness with which the republic's coal industry develops in the 11th Five-Year Plan. What production intensification means is that the required coal mining and concentration volumes may be achieved by reequipping main and auxiliary production processes, raising the organizational level of production and control and improving the use of material, technical and labor resources.

The 26th CPSU Congress posed the task of reequipping coal industry. "Accelerate development and assimilation of series production of highly productive complexes of equipment for mining coal in complex mining and geological conditions and for conducting preparatory operations. Expand creation and introduction of automated resources for mining coal in shafts without the constant presence of people at the working faces. ...improve working conditions and accident prevention."*

During the 10th Five-Year Plan Ukrainian coal industry did achieve certain successes. More than 1 billion tons of coal were mined, 54 billion rubles of capital investments were assimilated, and nine new mines and 265 new horizons were placed into operation.** But at the same time the present coal mining rate is not in keeping with the growing demand for fuel.

In the Donets Basin, where the prospects for mining development are the greatest in terms of the size of the industrial coal reserves, significant changes occurred in the production and labor conditions, elicited by yearly increases in mine depth averaging 10-12 meters. Consequently the mining and geological conditions worsened--rock pressure, temperature, flooding, gas content and the

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* "Materialy XXVI s"yezda KPSS" [Proceedings of the 26th CPSU Congress], Moscow, Politizdat, 1981, p 150.

** Grin'ko, N. K., "Beginning the New Five-Year Plan," UGOL' UKRAINY, No 1, 1981.

danger of coal and rock blowouts have risen. All of this is having an unfavorable influence on the technical-economic indicators of the work of the mines. Coal industry is distinguished by a high capital-output ratio, and concurrently by a lack of equipment to support the production processes and by the high laboriousness of the work. The proportion of manual labor in mining and preparatory operations, in underground transport, in operations on the mine surface and in repair and maintenance of mine drifts continues to be rather high. Construction and reconstruction of coal enterprises is not promoting reproduction of the diminishing output capacities of the mines.

Raising the rate of increase of new fuel mining capacities and reequipment of coal enterprises are the principal objectives in production development posed by the 26th Congress of the Ukrainian Communist Party to the republic's coal industry. In 1981-1985 seven mines and two concentration factories are to be finished and placed into operation, and six mines and three concentration factories are to be rebuilt. As a result the increase in output capacity should be 24 million tons of coal per year.* Moreover construction and reconstruction of 13 mines, 2 open pits and 6 concentration factories are to begin.**

Coal industry is characterized by unique production features associated with continual changes in the mine fund due to introduction of new mines and working horizons and abandonment of spent mines, movement of the working places and change in the mining and geological conditions affecting the work. Correspondingly, the design of mining machinery and mechanisms is being improved, and new machinery is being created.

Recently coal industry has done a great deal of work to improve the planning of scientific and technical development. The main directions of coal industry's reequipment were reflected in the "Integrated Program of Scientific-Technical Progress" and in the "Specific-Purpose Integrated National Economic 'Energokompleks' Program," drawn up by the republic's planning organs and its planning and design, scientific research and other organizations. In these programs, the work of the mines, the concentration factories and plants has been subordinated to the one goal pursued by production intensification--increasing coal extraction and concentration through growth in equipment availability.

The following measures, foreseen by the programs, are being implemented with the purpose of reaching the reequipment objectives of the republic's coal industry:

Existing mining processes are being improved, and new nontraditional coal mining methods not requiring the digging of shafts are being sought;

equipment and processes for mining thin and explosive gently and steeply sloping seams offering complex mining and geological conditions are being created and introduced;

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* "Materialy XXVI s"yezda Kommunisticheskoy partii Ukrainy" [Proceedings of the 26th Congress of the Ukrainian Communist Party], Politizdat Ukrainy, 1981, p 104.

** UGOL' UKRAINY, No 4, 1981, p 2

the underground and surface transportation and elevator system is being improved, its carrying capacity and reliability are being raised, and the traffic schedules are being optimized;

accident prevention in mining operations is being improved;

new progressive production processes and equipment used in coal concentration are being introduced;

the surface complex of coal mines is being improved, the construction base and the concentration factories are being expanded, enterprises making integrated use of wastes are being created, and thus environmental protection is being improved.

If we are to raise the level of production intensification at every mine, we would need to implement efficient ways to organize mine management, increase the size of the working faces, improve the use of equipment, staff all units with qualified personnel, strengthen labor and production discipline and introduce the best experience of the thousand-ton brigades everywhere.

In the last 20 years reequipment of the working faces has proceeded in the following direction in connection with new working conditions (thicker coal seams are being worked): A transition has been made from wide-span "Donbass," "Kirovets," "Shakhter," and "Gornyak" combines, which work coal seams with a thickness of 0.5 meters and more, to the more-productive narrow-span MK-67, 2K-52, IGSh-68 and other machines, which work thicker seams--from 0.7-0.8 meters up. In this connection the proportion of coal from thin seams decreased from 23 percent to 7-8 percent of the total extraction volume. Because the mines have been saturated with mining equipment working seams more than 0.8 meters thick, the rate of growth of the technical level of production has dropped. Moreover the mechanized complexes are not being utilized with adequate intensiveness.

Because of shortcomings in work organization, equipment idleness, a lack of manpower and so on, in the 10th Five-Year Plan 25.7 percent of the fully mechanized longwalls operated below their peak capacity (less than 500 tons per day), as a result of which the mechanized complexes fell short of their quotas by more than 5 million tons of coal.

Development of the mine pool and growth in coal extraction depend on utilizing the working faces and equipment efficiently, increasing the rate of advance along an operating longwall and consequently raising the mean annual and mean daily load on the working face (increasing the concentration of mining production). In the last five-year plan the quantity of operating working faces grew by 4 percent. Because of inadequate utilization of the working faces and the equipment the rate of extension of operating working faces decreased by 4 meters per month. In this case the coal losses were 14.7 million tons per year.

In the 11th Five-Year Plan and until 1990 the effectiveness of mining production is to be significantly raised, primarily through reequipment of extraction and preparatory operations. Further expansion of the use of narrow-span

equipment at a number of mines in the Donets Basin offers little promise because about 82 percent of the coal reserves are concentrated in thin seams (up to 1.2 meters thick). Today, extremely thin seams of high-quality coal are hardly being worked due to the absence of dependable extraction equipment.

Cutters and wide-span combines which had formerly worked thin seams were removed from mass production by coal machine building plants as being obsolete. An objective need has arisen for introducing new, modernized equipment and processes for extracting coal from not only thick but also thin and extremely thin gently and steeply sloping seams--the KM-88 mechanized complex (to replace the obsolete KM-87 and KMK-97), the KM-103 complex (KD80); the K103-KA80 narrow-span combine, the SN-75, SO-75 and UST-2M scrapers and others. Machinery required for steeply sloping seams include the KGU complex outfitted with the KGU-D mechanized prop, the "Poisk-2" narrow-span combine, the ANShch shield-shaped unit and others.

New methods of unmanned coal extraction from extremely thin gently and steeply sloping seams have special economic significance to coal mining technology. Machines have been invented for remote extraction--the US-3 scraper-cutter-ram with a higher relative power output, which is intended for gently and steeply sloping seams 0.4-0.8 meters thick, an auger borer (BShU) for gently and steeply sloping seams 0.6-0.85 meters thick, the KMD-72 complex and others. As a result of using the new equipment, the laboriousness of work at the working faces can be decreased by 1.3-1.5 times.

Today, tunneling operations in preparation for extraction are performed mainly by drilling and blasting and the use of rock loading machines, and 27 percent of the tunneling volume is carried out by tunneling combines. By the end of the five-year plan the proportion of tunneling done by combines and complexes must increase to 32-33 percent. Outlays of manual labor in conjuction with preparatory digging done by combines is to be reduced by 1.3-1.8 times in the 11th Five-Year Plan, and the tunneling rate is to increased. Modernization of tunneling complexes will entail not only raising the rate of digging faces of the necessary cross section and achieving selective coal extraction, but also mechanizing the erection of temporary and permanent props of the preparatory tunnels and delivering supports and extracting rock from the face by remote control, which will make tunneling operations safer.

Preparatory tunneling is to be mechanized with new tunneling equipment: 4PP-2 and 4PP-2Shch tunneling combines and the "Strela-77" blind shaft tunneling machine. The 2PNB-2U loading machine, intended for sloped faces with an angle of up to 18°, and the MPK-3 loading machine, with a side-unloading bucket intended for working a slope of up to 12° are being introduced for coal and rock loading. The most laborious processes of cutting operations will be mechanized by the KN and KN-78 complexes and by a frontal recess-digging machine, based on a cutting combine (KN), which digs recesses that join longwalls to drifts. Introduction of improved B-68 KP drilling units is recommended for shaft drilling at steep seams. These units are intended for the drilling of ascending shafts with a diameter of 250 mm and more up to one story high. Also recommended is the B-100-200 automated drilling unit, capable of drilling shafts with a diameter of 100 mm.

Because rock pressure increases in deep mines, improved props exhibiting better pliancy are required. There are plans for introducing arched props made from low-alloy steel and equipped with locking joints that insure stable operating characteristics.

Automation and remote control of mining machines and mechanisms is promoting a savings of manpower. There are plans for introducing units with program-contolled working organs, television systems and driving units for combines, load adjusters and dust-suppression devices. There are plans for introducing drilling machines capable of fixing the axial direction of shaft drilling and surmounting transverse forces that distort the drilling direction. A proposal has been made for outfitting them with a remote control mechanism capable of controling their work in three dimensions.

The transportation system used to haul loads out of mines is a bottleneck in coal enterprises as a rule. Furnishing all extraction sections with conveyors has been planned as a way to solve the transportation problem. Conveyorization of the main hauling tunnels is to be expanded: Belt conveyors of greater capacity, heavy locomotives and high-capacity rail cars are to be used. The traffic flow systems are to be improved in such a way as to insure continuity in the hauling of loads from the working face to the surface. Such improvement will be achieved by introducing an automated transportation control system. The more-sophisticated permanently installed mining equipment will also be switched to automatic control: shaft elevators, water draining units, ventilation and compressor units, and skip and framework elevators.

Accident prevention is acquiring special significance. An automatic dust and gas monitoring system, machines and instruments to support the seismoacoutic method of predicting sudden blowouts of coal and gas, higher-power ventilation units and fans, automatic sluicing systems to improve ventilation at working faces, freon coolers and movable refrigerators to insure normal thermal operating conditions will be employed in mines characterized by deep coal seams lying in complex mining and geological conditions, harboring the danger of sudden blowouts of coal and gas and experiencing high temperatures.

Concentration of mining operations and reduction of the length of working faces to be supported, and introduction of machines to undercut the soil and to extract old props should help to reduce the laboriousness of the repair and maintenance of mine working faces. Use of new kinds of props that are strong and exhibit greater pliancy in response to higher rock pressure is recommended.

It would suitable to improve the system of current and major repairs on mining and concentration equipment. There are plans for centralizing and improving repair shops and plants, converting to a new unit-by-unit repair method and introducing unified resources for assembling and disassembling mining and tunneling complexes, conveyors and other equipment.

At present the ash content of extracted coal is 25-30 percent. The main objective of intensifying coal concentration is to reduce the ash content of commercial coal. For this purpose the Ukrainian Scientific Research, Planning and Design Institute of Coal Concentration and Briquetting is developing new equipment and improving existing coal concentration processes in order to

improve the quality and assortment of commercial products and reduce the losses of coal together with concentration wastes by 1 million tons per year, in comparison with the 1980 level.

There are plans for introducing new highly productive equipment, OM-24 jigging machines, MFU-2 flotation machines, "Gornyak" vacuum filters and S10 flotation tailing thickeners. Moreover new research projects are to be conducted aimed at improving the procedures for concentrating large and small classes of coal and for dehydrating and drying the products of sludge concentration, thickening and filtration.

Fulfillment of these projects will help to keep the ash content of commercial coal concentration products at the 1980 level--15.1 percent--in the face of a 3.3 percent increase in the ash content of the coal that is mined and sent for processing (from 26.7 percent in 1980 to 30.3 percent in 1985). Moreover the yield of concentrate will be increased by 0.5 percent, and the annual rate of growth of coal processing at the factories will increase.

To support reequipment of the mines and concentration factories, we need to foresee the appropriate production program for machine building plants producing mining and concentration equipment and supplying the required mechanization resources. The base of construction industry will have to be expanded, and enterprises capable of integrated waste processing will have to be created.

Development and implementation of an integrated program of scientific-technical progress and of specific-purpose programs aimed at solving scientific-technical problems noted to be significant by the 26th CPSU Congress will make it possible to hasten reequipment and intensification of production in coal industry.

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PIPELINE CONSTRUCTION

CSSR PIPELINE CONSTRUCTION REPORT

Moscow IZVESTIYA in Russian 13 Sep 82 p 5

/Article by IZVESTIYA correspondent in Prague L. Kornilov: "Steel Shoulders of Light Blue Fire"/

/Text/ Czech specialists are beginning construction of a new thread of the Siberia-Western Europe transit gas pipeline on CSSR territory.

Duty here is conducted round-the-clock and it is possible to penetrate the premises only by a special pass drawn up beforehand. Such precautions are understandable. After all, the question concerns the main control of the Soviet Union-West transit gas pipeline passing over the territory of Czechoslovakia. The slightest error or carelessness can cause interruptions in the gas flow. This is intolerable, and therefore all measures are taken here so that the possibility of such interruptions is eliminated. And what if if really happens--well, in a word, minutes are sufficient for the system, as they say, to react to any trouble...

Engineer Miroslav Gebki, a deputy of the main dispatch, talked to me about this.

"There was not one instance of an interruption in supplying gas that was our fault," he says, "and the volume is increasing all the time." In June here, they celebrated a considerable jubilee: the 200 billionth cubic meter of gas was pumped through. And yet quite recently, in 1973, they celebrated only the first billion to transit... Joseph Odvarka, CSSR government representative for constructing the fourth thread of the gas pipeline, related how the first intergovernmental agreement was prepared and concluded. What does the "fourth thread" mean? A little about that further, but for the present let's listen to comrade Odvarka.

"At that time we still did not have any experience in constructing such gas pipelines. We knew the matter only from theoretical literature. But, as in many other ways, cooperation with the Soviet Union proved to be decisive. With the assistance of Soviet specialists, we began to assimilate both the technology and the organization of the matter. We recall our comrades from the USSR--from the minister to the welder and the bulldozer drive--always with an especially warm and grateful feeling. After all, it was then that somebody in

the West attempted to hinder construction of the gas pipeline from the USSR, which at first served only Czechoslovakia, but then went even farther to other countries. We were not sold the pipes, vehicles and equipment, and the pipelaying cranes... But the Soviet pipelaying cranes arrived and laid the Soviet pipes. There should be a monument erected to this machine! A monument which, incidentally, would show who is attempting today to put a spoke in the wheel of the "gas-pipeline" deal, and also that the Soviet Union with the aid of its true friends can solve independently any problem with honor..."

In reality, history gives not only object lessons, but up-to-date ones as well. Apparently it's not useless from here in Prague to remind somebody that the Czech transit gas pipeline was and remains a strong and proven link in the European system of main gas pipelines. The hands of friends carefully catch the Soviet gas delivered via our country to its state border and deliver it farther to the West to the boundaries of the socialist commonwealth: receive it esteemed partners! There will not be any interruptions! Here is the spirit of common European cooperation and the spirit of Helsinki in action! The CSSR deputy minister of fuel and energy Miroslav Prshkryl says: "We have done everything in order to support the new and mighty plan of the Soviet Union. Eastern and Western Europe will be connected still by one powerful gas bridge. Look at the map. From the USSR it will pass over Czech territory from a border transfer station in Vel'ke-Kapushani to the Weidhaus (FRG) transfer station. This is resolved, and it will be done. After January 1, 1988, the "fourth thread" will be working at full power. But even before that, we will provide for the passage of all gas sold by the Soviet side and the delivery of which, as we know, will begin after 1984."

So, the fourth thread is the new 860 kilometers of steel pipes with a 1,400 millimeter diameter. The fourth thread is the calm and confident answer of socialist Czechoslovakia to the convulsive attempts from across the ocean to inhibit commercial cooperation of the European countries. The fourth thread is irreproachably and present the time of maturity for the operating transit gas pipeline passing over CSSR territory. As with all the preceding, this fourth one is materializing as if it were a single general line in progress by the Soviet Union and the socialist countries--a line for peaceful coexistence, commercial cooperation, and a climate of disarmament on European soil.

The question concerning the fourth thread was principally resolved this summer in Prague. Representatives of the Soviet and Czech governments signed the agreement. Naturally, the time has come now for immediate concrete actions, and already we have begun them. Czech specialists are enumerating those complexities which they must encounter. It is not a joke: if 23 billion cubic meters of Soviet gas now pass annually through the CSSR to the West, then 27 billion will go by means of the fourth thread alone! Other capacities and new equipment will be required in order to "digest" this gigantic volume. Here, demand produces supply, so to speak. Just as it was, by the way, during construction of the third thread also.

It is necessary to construct three new large compressor stations in order to achieve the projected pressure in the pipes of the "fourth" one. And if gasoline engines with 6 megawatts of power each worked earlier at the stations, then it is planned to furnish seven units with four times the power of the previous ones on the fourth thread. These engines will be manufactured in the CSSR itself under Soviet license. When deliveries are completed for the transit gas pipeline, the Czech comrades do not plan to curtail business, but to deliver units for the Soviet Union as well.

Today, the most skilled welders, real masters of their occupation, are working at the "transit gas pipeline" enterprise. The enterprise is actively cooperating with Soviet scientists and engineers, first of all from the Institute of Electrical Welding imeni E.O. Paton in Kiev. The first apprentices traveled from the CSSR to Kiev, and then they went through training on construction of the gas pipeline in the USSR. In 1966, comrade Odvarka himself traveled with a group of Czech welders beyond the Artic Circle where they worked in minus 53 degree temperatures...Here the welders found experience which later assisted them during passage through the Carpathian Mountains. Today, the quality of a Czech seam in the welding of gas lines is higher than the world level: only seven-tenths of a percent of the seams do not measure up to the necessary standard. Three hundred welders of the highest rating, the so-called "passporters" having their own seam certificate, work at the "Plinostav" enterprise in Pardubice. In this very city there is a school also preparing workers here according to the Soviet method. And what is remarkable too is the feedback, so to speak, taking effect already: not so long ago an order arrived from the Institute of Electrical Welding imeni E.O. Paton--eminent specialists had become interested in the Czech welding wire which now will serve both for the CSSR and for the USSR.

Consequently, just what "welding" innovations were used during construction of the third thread? The requirements for welding quality increased significantly. In connection with that, a new and stronger material was used and the thickness of the pipe walls was reduced. This in turn required new welding electrodes...Of course, all these tasks were successfully resolved. Undoubtedly, the fourth thread will put forward more complex problem. It is also just as certain that everything will be in order with them.

A peculiarity of laying the gas pipeline on Czech soil is the fact that the pipes run through densely populated territory. Cities, villages, plowed fields, roads, and industrial enterprises...The first paths were not easy to lay here, but they laid them! They resolved the problems by themselves too. For example, a rule was established: at the state farms, agricultural cooperatives, and forest districts, the pipelaying workers have the right "to take away" the soil for not more than a year. But after a year, they are obliged to return it in a re-cultivated form, i.e. once again suitable for plowing and tree planting. And this rule is carried out unconditionally.

Travelling around Czechoslovakia, as sometimes happens, you notice "traces" of the gas pipeline (of course, usually you don't see them--the pipes lie under the earth) and the steel banks of the gas-bearing river surrounded by flowers and grasses just as if no one had touched the living nature here...

A steel rainbow-arch rose here over the green meadows of a reserved park in Vel-trusy. This gas pipeline crosses the Vltava. The smooth bend of the modern pipe-bridge henceforth has entered the collection of 17th century architectural monuments liberally scattered around a palace in which, as they say, the first international exhibition fairs in Europe began to function about 300 years ago--forecasters of trade and commercial cooperation of nations. Well, it's a noteworthy neighborhood.

Today, the most important matters, which are common for all of its nations, are troubling old Europe: peace, friendship, and commercial ties. The European countries bring together many problems including overcoming an energy shortage. And really, don't the handmade gas rivers from the Soviet Union of considerable support in this matter? Indeed posing such a question to any sensible person appears to be superfluous.

Socialist Czechoslovakia itself constructed a gas pipeline on its own territory and successfully accomplished the transit. The "transit gas pipeline" also is known as a specially created enterprise and a socialist concern which has taken upon itself the full responsibility for construction and operation of those gas rivers. In accordance with the principle of mutual benefit accepted in economic relations between socialist countries, the CSSR receives as payment for transit a specified percentage of the natural gas for its own needs. This gives it, an industrially developed country, a new supplementary source of valuable energy and fuel.

Four thousand people work at the "transit gas pipeline" enterprise of Czechoslovak-Soviet firendship. Every day quality control inspectors, chemists and cathodic protection workers leave for the route; the fire-fighting equipment always remains in readiness; sensitive detectors here reveal the slightest leak; these automatic pressure plants, the compressor stations, operate round-the-clock; the main dispatch computer incessantly monitors the gas flow...This entire army with the aid of complex systems and devices protects the gas pipeline from corrosion and accidents, and ensures its normal operation. The green street is always open for Soviet gas on Czech territory.

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PIPELINE CONSTRUCTION REPORT--GOR'KIY

Moscow PRAVDA in Russian 13 Sep 82 p 2

/Article by G. Chesnokov in Gor'kiy: "The Third Production Line"/

/Text/ The first tens of kilometers of the Urengoy-Pomary-Uzhgorod gas pipeline have been laid in southern Gorkiy Oblast. A collective from a section of the all-union welding-installation trust of the USSR Ministry of Construction of Petroleum and Gas Industry Enterprises is conducting operations on the route. However, this is no longer a section. The construction workers changed to a new system of organizing operations: a complex production line, the third on the route, was created.

Valentina Yakovlevna Belyayeva, a highly experienced specialist, was designated chief of the production line. Thousands of kilometers of the gas route laid out in various regions of the country are on her shoulders.

What is the main point of the innovation? Specialized work brigades in the production line work against a single allocation certificate. The main criterion of labor, and the end result among them is one and the same, is a kilometer of gas pipeline completely installed and prepared for testing.

I saw vigorous sprouts in the fields of "Red Plowman" kolkhoz where excavators just recently had operated. You couldn't even imagine that huge steel pipes lay here unnoticed under the earth. In another field, it is possible to determine that the route passes through here only by the scarcely noticeable clay streaks which were left on the edges of the former trench. At the same time, having caught sight of them, the production line chief V. Belyayeva is seriously upset: "We do not have the right to leave even those kinds of traces. The earth loves order!" Valentina Yakovlevna herself also loves order in everything. Although she herself has spent her entire life "on wheels", she does not tolerate the "bivouac" chaos. So of course a town of construction workers was built thoroughly and for business. Belyayeva made sure that everything was in it--both coziness and beauty. So that people felt at home. There is hot and cold water in the houses, and side by side are a dining hall, a store, a sauna, a library, and a children's playground. Construction of a club is being completed and they will have their own children's day nurseries. More than 500 people live in the town under the pine trees as one big and friendly family. They have been based

here for a long time: it is necessary to complete the basic route and still to lay several threads beside it. The construction workers quickly established contacts with the old-timers of the region. In spring they helped build dams on the reservoirs, repaired roads, and brought fertilizer to the fields. And V. Belyayeva, who furthermore was elected as a representative of the Pochinkovskiy region soviet of people's deputies, fulfills the mandate of the electorate.

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PIPELINE KAMA RIVER CROSSING REPORT

Ashkhabad TURKMENSKAYA ISKRA in Russian 5 Sep 82 p 1

/Article by unidentified TASS correspondent: "Preparing for a New Onslaught"/

/Text/ Sarapul (Udmurt ASSR), 4 September. Having completed laying the first thread of the underwater pipeline across the Kama considerably ahead of schedule, the Udmurt area construction workers of the Urengoy-Pomary-Uzhgorod gas main line, not reducing the pace already underway, today began tunnelling of the second trench on the bottom of the river.

Powerful dredges, capable of smashing rock, began development of a "bed" for the new underwater bridge. Simultaneously, the first blocks out of large diameter pipe were being welded on the stand for the second 650-meter thread of the underwater pipeline. Doubly covering the shift requirements, the welders' collective led by Yu. Kozlov is showing here an example of shock labor. This veteran already of a quarter of a century is working on construction of the oil and gas lines.

The construction workers are based solidly for business on a new bridgehead. A small town of comfortable little mobile homes with an entire complex of facilities, where the Leningrad construction workers from the specialized directorate of underwater-technical operations settled, grew up on the steep Kama bank surrounded by age-old spruces. A dining hall, store, a lecture and display room are open in the town and a reliable concrete road leads here. Besides the two underwater pipelines, in the present five-year plan the collective is expected to continue six more lines along the bottom of the Kama for the fuel main line.

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PIPELINE CONSTRUCTION REPORT-PERM OBLAST

Moscow PRAVDA in Russian 15 Sep 82 p 1

/Article by traveling correspondent of the editorial staff of the Perm Oblast newspaper ZVEZDA at the gas pipeline construction L. Mogilenskikh: "Steel Thread of Kilometers"/

/Text/ Laying of the 1,115 kilometer section of the Urengoy-Novopskov gas pipeline is being completed. Its route already has crossed the territory of Tyumen, Sverdlovsk, and Perm Oblasts and Bashkir ASSR. Swamps, mountains and tens of water obstacles were overcome. Simultaneously with preparation of the section for testing, the better units of the Main Administration for Pipeline Construction in the Eastern Regions began laying the Urengoy-Uzhgorod export gas pipeline. ...A powerful pipelaying crane, having clasped a 36-meter steel lash, carefully moves it towards the pipeline. And suddenly a shower of sparks begins to fly off--the welders from V. Andreyev's work brigade are putting on the seams, extending the channel of the future gas river.

In early spring, the basic forces of the linear production line, a peculiar "caravan" of vehicles and units led by chief engineer of Novosibirsk Pipeline Construction Trust V. Lorents, were relocated here to Berezovskiy Rayon in Perm Oblast. By that time they had completed ahead of schedule the construction of a 42-kilometer section of gas pipeline in northern Sverdlovsk Oblast.

For laying the 1,420 millimeter diameter main gas pipelines, a daily "pace" of a one kilometer length of finished pipeline is considered the guarantee of a full, rhythmic operation of the production line. In this case, it is important that the production line proceeds uniformly and without jerks. But frequently it is hard to achieve such a rhythm: ravines, rocks, rivulets, and swamps are encountered on the route. Consequently, a "fastening up" and a considerable advance are necessary in the smooth areas. And they have learned to achieve it in the production line of V. Lorents. On separate days, the construction workers moved forward by 2-2.5 kilometers. According to the results of the weekly shock labor duty periods, the collective won first place by five-fold in the USSR Ministry of Construction of Petroleum and Gas Industry Enterprises competition. The last joint on the 74-kilometer section of the Urengoy-Novopskov route which was allocated to it was welded up to a month earlier than planned.

Not losing time, the welders' work brigade has started working on the export gas pipeline. Tens of kilometers of pipe already are welded in a lash on the tilting stands. A portion of them is connected on the route to the steel thread.

A. Pavlov, deputy chief of general contracting directorate No. 4 in this production line says: "According to preliminary calculations, in October we will complete already the basic line operations."

Once again the construction workers are given a very compressed period. One section of the export gas pipeline route still awaits them in northern Sverdlovsk Oblast.

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PIPELINE CONSTRUCTION

VIGOROUS DEVELOPMENT OF TULAMASHGAZ REPORTED

Moscow PRAVDA in Russian 12 Sep 82 p 1

/Article by PRAVDA supernumerary correspondent in Tula N. Makharinets: "Electric Power Stations for the Main Line"/

/Text/ Large lots of complete equipment are being dispatched ahead of schedule from Tula to various points of the surrounding Urengoy-Pomary-Uzhgorod gas pipeline. The "Tulamashgaz" is producing it. Maybe it is one of the youngest among the enterprises of the "Tulamashgaz" hero city. Its birth caused vigorous development of the gas industry.

Chief plant engineer G. Emukhin says: "We produce technological block-boxes of various designations, block and non-standard equipment, and connecting components. Our collective is meeting the orders of the construction workers of the very long-range gas pipeline with a sense of great responsibility."

Having begun from small production of individual simple devices, it is now performing important tasks. Just now the outfitting of two "BES-630" regular diesel electric power stations is being completed on the stands of the assembly shop. This is a new product whose output was mastered in a short time. Each such automated station with a 630 kilowatt capacity is arranged in a compact metal box--a strong and attractive accommodation of the rail car type. The fitter-assembler work brigades of L. Samoylov and N. Kuznetsov, the electricians of A. Taruntayev and others engaged in these operations function rapidly by combining outfitting operations and getting ahead of shift schedules. Their comrades in neighboring sections also are working on a shock labor basis. Besides several BES-630 power stations, individual blocks of equipment, machinery and devices are being dispatched to the areas of compressor stations being erected on the route. A precise production rhythm is the result of the work brigade form of labor organization. The contribution of each worker to the total success is evaluated on the basis of labor participation factors. There are no laggards in the shop. Among the best workers are the blacksmith A. Kolobkov, the electrical welders N. Kulikov and I. Fedotenkov, and the metals reheater N. Davydov.

The "Tulamashgaz" plant collective is committed to ship all production for the Urengoy-West border gas pipeline to the construction areas ahead of schedule.

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